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     FILE 'CAPLUS, BIOSIS, MEDLINE, SCISEARCH, USPATFULL, EMBASE, PASCAL,
     CABA' ENTERED AT 08:28:03 ON 14 DEC 2004
L2         13409 S L1 AND (VARIANT OR MUTANT)
L3           843 S THERMOSTABLE AND L2
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L3 ANSWER 833 OF 843 PASCAL COPYRIGHT 2004 INIST-CNRS. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 1992-0197726 PASCAL
TITLE (IN ENGLISH): Efficient production of **thermostable** Clostridium thermosulfurogenes β- **amylase** by Bacillus brevis
AUTHOR: MIZUKAMI M.; YAMAGATA H.; SAKAGUHI K.; UDAKA S.
CORPORATE SOURCE: Nagoya univ., fac. agriculture, dep. food sci. tech., Chikusa-ku Nagoya 464, Japan
SOURCE: Journal of fermentation and bioengineering, (1992), 73(2), 112-115, 17 refs.
ISSN: 0922-338X CODEN: JFBIEX
DOCUMENT TYPE: Journal
BIBLIOGRAPHIC LEVEL: Analytic
COUNTRY: Netherlands
LANGUAGE: English
AVAILABILITY: INIST-8234, 354000021654220060

AB The Bacillus brevis host-vector system was used for production of the **thermostable** Clostridium thermosulfurogenes β- **amylase**. The promoter and translation initiation regions of thecell wall protein gene operon (cwp) of B. brevis were used to express the β- **amylase** gene in B. brevis 47. B. brevis 47K, a previously isolated **mutant** that secreted human α- **amylase** efficiently was shown to be also a good host for the β- **amylase** production

L3 ANSWER 834 OF 843 PASCAL COPYRIGHT 2004 INIST-CNRS. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 1989-0287237 PASCAL
TITLE (IN ENGLISH): Continuous production of **thermostable** β- **amylase** with Clostridium thermosulfurogenes: effect of culture conditions and metabolite levels on enzyme synthesis and activity
AUTHOR: NIPKOW A.; SHEN G.-J.; ZEIKUS J. G.
CORPORATE SOURCE: Michigan biotechnology inst., Lansing MI 48909, United States
SOURCE: Applied and environmental Microbiology, (1989), 55(3), 689-694, 29 refs.
ISSN: 0099-2240 CODEN: AEMIDF
DOCUMENT TYPE: Journal
BIBLIOGRAPHIC LEVEL: Analytic
COUNTRY: United States
LANGUAGE: English
AVAILABILITY: CNRS-7195

AB A β- **amylase**-overproducting **mutant** of Clostridium thermosulfurogenes was grown in continuous culture on soluble starch to produce **thermostable** β- **amylase**. Enzyme productivity was reasonably stable over periods of weeks to months. The pH and temperature optima for β- **amylase** production were pH 6.0 and 60C, respectively. Enzyme concentration was maximized by increasing biomass concentration by using high substrate concentrations and by maintaining a low growth rate. β- **Amylase** concentration reached 90 U ml.sup.-.sup.1 at a dilution rate of 0.07 h.sup.-.sup.1 in a 3% starch medium. A further increase in enzyme activity levels was limited by acetic acid inhibition of growth and low β- **amylase** productivity at low growth rates.

L3 ANSWER 835 OF 843 PASCAL COPYRIGHT 2004 INIST-CNRS. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 1986-0369725 PASCAL
TITLE (IN ENGLISH): Use of milk enzymes as indices of heat treatment
TITLE (IN FRENCH): Utilisation des enzymes du lait comme indices du traitement thermique applique

AUTHOR: GRIFFITHS M. W.
CORPORATE SOURCE: Hannah res. inst., Ayr, United Kingdom
SOURCE: Journal of food protection, (1986), 49(9), 696-705, 52 refs.
Project: 4 tabl.
ISSN: 0362-028X
DOCUMENT TYPE: Journal
BIBLIOGRAPHIC LEVEL: Analytic
COUNTRY: United States
LANGUAGE: English
NOTE: 4 fig.
AVAILABILITY: CNRS-547

L3 ANSWER 836 OF 843 CABA COPYRIGHT 2004 CABI on STN
ACCESSION NUMBER: 2004:13053 CABA
DOCUMENT NUMBER: 20033200168
TITLE: Effects of **mutant thermostable** [alpha]-**amylases** on rheological properties of wheat dough and bread
AUTHOR: Maeda, T.; Hashimoto, T.; Minoda, M.; Tamagawa, S.; Morita, N.
CORPORATE SOURCE: Lab. of Food Chemistry, Graduate School of Agriculture and Biological Sciences, Osaka Prefecture University, 1-1, Gakuen-cho, Sakai, Osaka 599-8531, Japan. morita@biochem.osakafu-u.ac.jp
SOURCE: Cereal Chemistry, (2003) Vol. 80, No. 6, pp. 722-727. 17 ref.
Publisher: American Association of Cereal Chemists. St Paul
ISSN: 0009-0352
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 20040112
Last Updated on STN: 20040112

AB **Thermostable mutant** alpha-**amylases** (21B, M111, and M77) with various degrees of thermostability were purified from Bacillus amyloliquefaciens F and used as improvers for breadmaking. Test baking with the **mutant** enzymes was conducted using the long fermentation sponge-dough method. Addition of an appropriate amount of **mutant** [alpha]-**amylases** to the ingredients distinctly increased the specific volume of the bread and improved the softness of breadcrumb as compared with the addition of Novamyl (NM), an exo-type [alpha]-**amylase**. M77 was the most effective in retarding the staleness of breadcrumb. The softness of breadcrumb during storage, however, was not correlated with thermostability. All **mutant** [alpha]-**amylases** weakened the mixing property of the dough, but strengthened the property of fermented dough. M77 and NM had different effects on the dough properties, but their bread qualities were similar to each other. The strong tolerance of M77 dough to the long baking process might be due to the production of hydrolysed starches, oligosaccharides in the range of maltopentaose to maltohexaose, as compared with NM. It is concluded that these **mutant** [alpha]-**amylases** are possible substitutes for NM as bread improvers.

L3 ANSWER 837 OF 843 CABA COPYRIGHT 2004 CABI on STN
ACCESSION NUMBER: 2002:172801 CABA
DOCUMENT NUMBER: 20023131744
TITLE: A novel, high performance enzyme for starch liquefaction: discovery and optimization of a low pH, **thermostable** [alpha]-**amylase**
AUTHOR: Richardson, T. H.; Tan, X. Q.; Frey, G.; Callen, W.; Cabell, M.; Lam, D.; Macomber, J.; Short, J. M.; Robertson, D. E.; Miller, C.

CORPORATE SOURCE: Diversa Corporation, 4955 Directors Place, San Diego, CA 92121, USA. trichardson@diversa.com
SOURCE: Journal of Biological Chemistry, (2002) Vol. 277, No. 29, pp. 26501-26507. 34 ref.
Publisher: American Society for Biochemistry and Molecular Biology Inc. Bethesda
ISSN: 0021-9258
DOI: 10.1074/jbc.M203183200
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 20021004
Last Updated on STN: 20021004

AB High throughput screening of microbial DNA libraries was used to identify [alpha]-**amylases** with phenotypic characteristics compatible with large scale corn wet milling process conditions. Single and multiorganism DNA libraries originating from various environments were targeted for activity and sequence-based screening approaches. After initial screening, 15 clones were designated as primary hits based upon activity at pH 4.5 or 95 [deg]C without addition of endogenous Ca2+. After further characterization, three enzyme candidates were chosen each with an exceptional expression of one or more aspects of the necessary phenotype: temperature stability, pH optimum, lowered reliance on Ca2+ and/or enzyme rate. To combine the best aspects of the three phenotypes to optimize process compatibility, the natural gene homologues were used as a parental sequence set for gene reassembly. Approximately 21 000 chimeric daughter sequences were generated and subsets screened using a process-specific, high throughput activity assay. Gene reassembly resulted in numerous improved **mutants** with combined optimal phenotypes of expression, temperature stability, and pH optimum. After biochemical and process-specific characterization of these gene products, one [alpha]-**amylase** with exceptional process compatibility and economics was identified. This paper describes the synergistic approach of combining environmental discovery and laboratory evolution for identification and optimization of industrially important biocatalysts.

L3 ANSWER 838 OF 843 CABA COPYRIGHT 2004 CABI on STN
ACCESSION NUMBER: 2002:29752 CABA
DOCUMENT NUMBER: 20013167913
TITLE: Worldwide distribution of [beta]-**amylase** thermostability in barley
AUTHOR: Kaneko, T.; Zhang, W. S.; Ito, K.; Takeda, K.
CORPORATE SOURCE: Plant Bioengineering Research Laboratories, Sapporo Breweries Ltd., 37-1, Kizaki, Nitta-machi, Nitta-gun, Gunma 370-0393, Japan.
SOURCE: Euphytica, (2001) Vol. 121, No. 3, pp. 223-228. 11 ref.
Publisher: Kluwer Academic Publishers. Dordrecht
ISSN: 0014-2336
PUB. COUNTRY: Netherlands Antilles
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 20020207
Last Updated on STN: 20020207

AB The thermostability of [beta]-**amylase** in 6752 lines of worldwide barley genetic resources were investigated. Most of the lines were classified into high (type A), medium (type B), and low (type C) thermostability. Subsequently, the geographical distribution of these types was clarified. About 90% of the East Asian (Japan, the Korean Peninsula, China) lines were type A. More than 95% of Ethiopian barley was type C. The thermostability types of varieties in the western areas (north Africa, southwest Asia, Turkey, Europe) consisted of types A, B and C. These results suggest that there is a clear geographical differentiation in [beta]-**amylase** thermostability, especially in East Asia and

Ethiopia. The phenotype characteristics of each thermostability type line reflected the geographical differentiation. Besides types A, B and C, we found new thermostability types, including such useful **mutants** as a [beta]-**amylase**-less **mutant** and highly-**thermostable mutants** than type A in both China and Nepal.

L3 ANSWER 839 OF 843 CABA COPYRIGHT 2004 CABI on STN
ACCESSION NUMBER: 2001:26690 CABA
DOCUMENT NUMBER: 20013001785
TITLE: Improvement of [beta]-**amylase** thermostability in transgenic barley seeds and transgene stability in progeny
AUTHOR: Kihara, M.; Okada, Y.; Kuroda, H.; Saeki, K.; Yoshigi, N.; Ito, K.
CORPORATE SOURCE: Plant Bioengineering Research Laboratories, Sapporo Breweries Ltd., 37-1 Kizaki, Nitta, Gunma 370-0393, Japan.
SOURCE: Molecular Breeding, (2000) Vol. 6, No. 5, pp. 511-517. 21 ref.
Publisher: Kluwer Academic Publishers. Dordrecht
ISSN: 1380-3743
PUB. COUNTRY: Netherlands Antilles
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 20010302
Last Updated on STN: 20010302

AB The genetic improvement of enzymes important in the brewing process is one of the main goals of barley biotechnology. For the improvement of [beta]-**amylase** thermostability in barley seeds, we have already constructed a **mutant thermostable** [beta]-**amylase** gene, using site-directed mutagenesis and random mutagenesis to achieve the substitution of seven amino acids of the original barley [beta]-**amylase**. This sevenfold-**mutant** barley [beta]-**amylase** showed a thermostability increased by 11.6[deg]C compared to the original enzyme. In the present article, a **thermostable** [beta]-**amylase** gene under the control of the barley [beta]-**amylase** promoter was introduced to barley protoplasts, and fertile plants were generated from 9 independent transgenic lines. Subsequent analyses indicated that the **thermostable** [beta]-**amylase** gene was expressed and [beta]-**amylase** activity derived from both native and modified genes was detected in the seeds of 6 transgenic lines. The transgene was stably transmitted to progeny, and **thermostable** [beta]-**amylase** was synthesized in T4 seeds, demonstrating that our strategy is applicable for the improvement of seed quality for industrial utilization.

L3 ANSWER 840 OF 843 CABA COPYRIGHT 2004 CABI on STN
ACCESSION NUMBER: 1999:93188 CABA
DOCUMENT NUMBER: 19991003771
TITLE: Cloning of a **thermostable** ascorbate oxidase gene from Acremonium sp. HI-25 and modification of the azide sensitivity of the enzyme by site-directed mutagenesis
AUTHOR: Takeda, K.; Itoh, H.; Yoshioka, I.; Yamamoto, M.; Misaki, H.; Kajita, S.; Shirai, K.; Kato, M.; Shin, T.; Murao, S.; Tsukagoshi, N.
CORPORATE SOURCE: Research Laboratory, Ichibiki Co., Ltd., Toyohashi, Aichi 441-8019, Japan.
SOURCE: Biochimica et Biophysica Acta, Protein Structure and Molecular Enzymology, (1998) Vol. 1388, No. 2, pp. 444-456. 28 ref.
ISSN: 0167-4838

DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 19990707
Last Updated on STN: 19990707

AB A gene encoding a **thermostable** ascorbate oxidase (ASOM) was cloned from Acremonium sp. HI-25 and sequenced. The gene comprised 1709 bp and was interrupted by a single intron of 57 bp. ASOM consisted of 551 amino acids including a signal peptide with a molecular mass of 61 200, and contained 4 histidine-rich regions with high sequence homology to the corresponding regions of other multicopper oxidases. The ASOM gene was expressed in Aspergillus nidulans under the Aspergillus oryzae Taka-**amylase** A gene promoter. The recombinant enzyme (An-ASOM) exhibited almost the same enzymatic properties as ASOM. The ASOM gene was mutated by site-directed mutagenesis with reference to the amino acid sequences of plant enzymes to generate enzymes with altered azide sensitivity. Site-directed mutagenesis at the trinuclear active copper site resulted in an increase in azide resistance; the Ala465Leu and Phe463Trp/Ala465Leu **mutants** exhibited approximately 10 and 20% increases in azide resistance, respectively.

L3 ANSWER 841 OF 843 CABA COPYRIGHT 2004 CABI on STN
ACCESSION NUMBER: 1998:25886 CABA
DOCUMENT NUMBER: 19980301068
TITLE: Purification, characterisation and mutagenic enhancement of a thermoactive [alpha]-**amylase** from Bacillus subtilis
AUTHOR: Uguru, G. C.; Robb, D. A.; Akinyanju, J. A.; Sani, A.
CORPORATE SOURCE: Department of Bioscience & Biotechnology, University of Strathclyde, The Todd Centre, 31 Taylor Street, Glasgow G4 0NR, UK.
SOURCE: Journal of Industrial Microbiology & Biotechnology, (1997) Vol. 19, No. 4, pp. 273-279. 36 ref.
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 19980309
Last Updated on STN: 19980309

AB Bacillus subtilis was isolated from flour mill wastes; it produced a **thermostable** [alpha]-**amylase** in complex media containing starch. **Amylase** activity was greatest at the exponential phase and was more strongly expressed with starch from sorghum, yam peel or maize than with soluble potato starch. The enzyme was purified 24-fold to a specific activity of 2200 U/mg, in 10% yield. It gave a single band in SDS-PAGE, and its apparent MW was 54780 as determined by mass spectrometry; optima for activity were 80[deg]C and pH 5.6. During hydrolysis of yam peel, sorghum or corn starch, it released saccharides with degree of polymerization 1-6. Hyperproductive **mutants** were obtained by exposing cells of B. subtilis to ultraviolet irradiation (activity up to 124 U/mg), N-methyl-N'-nitro-N-nitrosoguanidine (up to 206 U/mg), or both.

L3 ANSWER 842 OF 843 CABA COPYRIGHT 2004 CABI on STN
ACCESSION NUMBER: 1998:859 CABA
DOCUMENT NUMBER: 19970311258
TITLE: Strain improvement for the production of a **thermostable** [alpha]-**amylase**
AUTHOR: Sidhu, G. S.; Sharma, P.; Chakrabarti, T.; Gupta, J. K.
CORPORATE SOURCE: Department of Microbiology, Panjab University, Chandigarh 160014, Indian Punjab, India.
SOURCE: Enzyme and Microbial Technology, (1997) Vol. 21, No. 7, pp. 525-530. 34 ref.
ISSN: 0141-0229
DOCUMENT TYPE: Journal

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